1. (5 points) An urn contains one fair six-sided die and the one fair eight-sided die. One of these two dice is drawn randomly from the bag and then rolled.

1. What is the probability of rolling a five?

2. What is the probability that the die we selected had six sides given that we rolled a five?

2. (5 points) Toss a fair coin three times. Let $A_1$ denote the event that the first and second tosses give the same outcome, let $A_2$ denote the event that the first and third tosses give the same outcome, and let $A_3$ denote the event that the second and third tosses give the same outcome.

1. Are $A_1$ and $A_2$ independent? Show your work.

2. Is the family \{$A_1, A_2, A_3$\} mutually independent? Show your work.